Jing Shuang (Lisa) Li

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Academic Positions

Assistant Professor of Electrical Engineering and Computer Science — Sep 2023 – Present
Michigan Neuroscience Institute Affiliate
University of Michigan, Ann Arbor MI

Education

Ph.D. in Control & Dynamical Systems — Sep 2018 – Jun 2023
Thesis: Distributed Control Theory for Cyberphysical and Biological Systems
California Institute of Technology, Pasadena CA

B.A.Sc. in Engineering Science, Electrical and Computer Engineering Major — Sep 2013 – Jun 2018
University of Toronto, Toronto ON

Publications and Preprints

* denotes equal contribution

[21] J. Gill, **J. S. Li**, "Identifying Network Structure of Nonlinear Dynamical Systems: Contraction and Kuramoto Oscillators", *in submission* [pdf]

[20] J. Gill, **J. S. Li**, "Identifying Network Structure of Linear Dynamical Systems: Observability and Edge Misclassification", *in submission* [pdf]

[19] J. Ting, **J. S. Li**, "Path Integral Bottleneck: An Algorithm-Agnostic Framework of Computation and Control", *in submission* [pdf]

[18] J. Ting, **J. S. Li**, "Two-Layer Attention Optimization for Bimanual Coordination", *2025 American Control Conference (ACC)* , pp. 2748–2754, 2025

[17] **J. S. Li**, "Toward Neuronal Implementations of Delayed Optimal Control", *2025 American Control Conference (ACC)*, pp. 2715–2721, 2025

[16] Y. Du, **J. S. Li**, "Distributed Continuous-Time Control via System Level Synthesis", *in submission* [pdf]

[15] J. Zhao, M. Yang, **J. S. Li**, "Human Balancing on a Log: A Switched Multi-Layer Controller", *2025 American Control Conference (ACC)*, pp. 1926–1931, 2025

[14] L. Karashchuk*, **J. S. Li***, G. M. Chou, S. Walling-Bell, S. L. Brunton, J. C. Tuthill, B. W. Brunton, "Sensorimotor delays constrain robust locomotion in a 3D kinematic model of fly walking", *eLife* 13:RP99005, 2024

[13] A. Aspeel, J. Nylof, **J. S. Li**, N. Ozay, "A Low Rank Approach to Minimize Sensor-to-Actuator Communication in Finite Horizon Output Feedback", *IEEE Control Systems Letters (L-CSS)*, pp. 3609–3614, 2023

[12] **J. S. Li**, C. Amo Alonso, "Global Performance Guarantees for Localized Model Predictive Control", *IEEE Open Journal of Control Systems*, vol. 2, pp. 325–336, 2023

[11] **J. S. Li***, A. A. Sarma*, T. J. Sejnowski, J. C. Doyle, "Internal feedback in the cortical perception–action loop enables fast and accurate behavior", *Proceedings of the National Academy of Sciences (PNAS)*, vol. 120 (39), pp. e2300445120, 2023

[10] C. Amo Alonso, **J. S. Li**, N. Matni, J. Anderson, "Distributed and Localized Model Predictive Control—Part II: Theoretical Guarantees", *IEEE Transactions on Control of Network Systems (TCNS)*, vol. 10 (3), pp. 1113–1123, 2023. ***IEEE Transactions on Control of Network Systems Best Paper Award***

[9] F. Xiao, **J. S. Li**, J. C. Doyle, "Flux Exponent Control Enables Prediction of Metabolism Dynamics", *American Control Conference (ACC)*, pp. 1189–1194, 2023

[8] **J. S. Li**, J. C. Doyle, "Distributed Robust Control for Systems with Structured Uncertainties", *2022 IEEE Conference on Decision and Control (CDC)*, pp. 1702–1707, 2022

[7] L. Conger, **J. S. Li**, E. Mazumdar, S. L. Brunton, "Nonlinear System Level Synthesis for Polynomial Dynamical Systems", *2022 IEEE Conference on Decision and Control (CDC)*, pp. 3846–3852, 2022

[6] C. Amo Alonso, **J. S. Li**, J. Anderson, N. Matni, "Distributed and Localized Model Predictive Control—Part I: Synthesis and Implementation", *IEEE Transactions on Control of Network Systems (TCNS)*, vol. 10 (2), pp. 1058–1068, 2023

[5] **J. S. Li**, "Internal Feedback in Biological Control: Locality and System Level Synthesis", *American Control Conference (ACC)*, pp. 474–479, 2022. ***Best Student Paper Finalist***

[4] J. Stenberg, **J. S. Li**, A. A. Sarma, J. C. Doyle, "Internal Feedback in Biological Control: Diversity, Delays, and Standard Theory", *American Control Conference (ACC)*, pp. 462–467, 2022

[3] A. A. Sarma, **J. S. Li**, J. Stenberg, G. Card, E. S. Heckscher, N. Kasthuri, T. J. Sejnowski, J. C. Doyle, "Internal Feedback in Biological Control: Architectures and Examples", *American Control Conference (ACC)*, pp. 456–461, 2022

[2] **J. S. Li**, C. Amo Alonso, J. C. Doyle, "Frontiers in Scalable Distributed Control: SLS, MPC, and Beyond", *American Control Conference (ACC)*, pp. 2720–2725, 2021

[1] **J. S. Li**, D. Ho, "Separating Controller Design from Closed-Loop Design: A New Perspective on System-Level Controller Synthesis", *American Control Conference (ACC)*, pp. 3529–3534, 2020

Toolboxes

[T2] S. H. Tseng, **J. S. Li**, "SLSpy: Python-Based System-Level Controller Synthesis Framework", 2020 [pdf] [code]

[T1] **J. S. Li**, "SLS-MATLAB: MATLAB Toolbox for System Level Synthesis", 2019. [code]

Invited Talks

Layered control in animal sensorimotor systems — Jul 2025
Telluride Neuromorphic Cognition Engineering Workshop

Global Performance Guarantees for MPC Under Sparse Local Communication — Jun 2025
Leveraging Sparsity in Control Workshop
European Control Conference

What can control theory tell us about neural circuits? — Apr 2024
Dynamics of brain computations through the lens of control theory workshop
Computational and Systems Neuroscience (COSYNE) Conference

Layered control in animal sensorimotor systems — Dec 2024
Control Architecture Theory Workshop
IEEE Conference on Decision and Control

Optimal control in sensorimotor systems — Jun 2024
Autonomy Talks

Optimal control in animal sensorimotor systems — Apr 2024
10th Midwest Workshop on Control and Game Theory

Optimal feedback control in sensorimotor systems: behavior and implementation — Mar 2024
Manifolds in Nature Workshop

Optimal and distributed control in animals — Jan 2024
University of Michigan Controls Seminar

Control theory for neuroscience: from internal feedback to legged locomotion — Jul 2023
Woods Hole Workshop on Computational Neuroscience
Telluride Neuromorphic Cognition Engineering Workshop

Introduction to System Level Synthesis — Dec 2022
System Level Synthesis: New Frontiers in Distributed Control Workshop
IEEE Conference on Decision and Control

Internal Feedback Pathways: From Control Theory to Sensorimotor Systems (and beyond) — Nov 2021
Center for Computational Neuroscience, Flatiron Institute

Teaching

Control Systems Analysis and Design (EECS 460) — F2024, F2025

Linear Systems Theory (ECE 560) — F2023, W2025

Special Topics: Control Theory for Biological Sensorimotor Systems (EECS 598) — W2024

Advising & Mentorship

PhD	Master's	Undergraduate
Yaozhi Du, W2025 –	Pengyang Wu, F2025	Bowen Mei, F2025 – W2026
Jaidev Gill, F2024 –	Enxu Liu, F2024	*PURE-ECE Program*
Eric (Qin) He, F2024 –	Riley Bridges, S/S2024 – F2024	Aida Ruan, S/S2024
Justin Ting, W2024 –	Ethan Parham, S/S2024 – F2024	*WISE RP Summer Scholar*
	Prerana Lakshmanan, S/S2024	Anisha Sharma, S/S2024
	Yaozhi Du, W2024 – F2024	Mo Yang, S/S2024 – F2024
	Qunzhuo Feng, F2023 – W2024	Jiayi Zhao, S/S2024 – F2024

W: Winter term (Jan – Apr); S/S: Spring/Summer term (May – Aug); F: Fall term (Sep – Dec)

Academic Service

Reviewer:

American Control Conference (ACC)
IEEE Conference on Decision and Control (CDC)
IEEE Control Systems Letters (L-CSS)
IEEE Open Journal of Control Systems (OJCSYS)
IEEE Trans. on Automatic Control (TAC)
IEEE Trans. on Control of Networked Systems (TCNS)
IEEE Trans. on Vehicular Technology
Neural Computation

Panel reviewer: Directorate for Engineering (ENG), NSF

Session chair/co-chair: ACC2025 Switched Systems; ACC2025 Biological and Bioinspired Systems

Poster/demo chair, 2024 ACM/IEEE International Conference on Cyber-Physical Systems

Lead workshop organizer, "System Level Synthesis: New Frontiers in Distributed Control" at IEEE Conference on Decision and Control (2022)

Funding Awarded

NSERC PGSD (ranked 4/72 in electrical engineering) Apr 2021

NSERC USRA (awarded twice) May 2015, May 2016

Additional Experience

Piano and Voice Instructor, Lippert Music Center Sep 2012 – Jun 2018
Taught private music lessons and prepared students for Royal Conservatory exams and competitions

Undergraduate Thesis, Reconfigurable Antenna Lab (advisor: S. Hum) Sep 2017 – Apr 2018
Project: Neural network inverse models for electromagnetic metasurface design

Full-Time Software Engineering Intern, Verity Studios AG Sep 2016 – Aug 2017
Wrote code in Python, C++, and SQL to support drone flight planning, evaluation, and simulation

Student Researcher, Reconfigurable Antenna Lab (advisor: S. Hum) May 2016 – Aug 2016
Project: C++ simulation tool for periodic electromagnetic scatterers

Student Researcher, Lab for Advanced Power Conversion (advisor: P. Lehn) May 2015 – Aug 2015
Project: Wireless energy harvester for smart-grid monitoring applications

Student Researcher, Nanomaterials Lab (advisor: H. G. Wei) May 2014 – Aug 2014
Project: Copper-based nanostructures for photocatalytic hydrogen production

Additional Skills

Programming and scripting: MATLAB, Python, C++, SQL

Foreign languages: Mandarin Chinese (fluent), French (basic)

Instruments: piano, voice (classical, musical theatre, pop), cello, guitar
Certifications from the Royal Conservatory of Music:

- Associate (ARCT) in Piano Performance, 1st Class Honours (practical only)
- Grade 10 comprehensive certificate in Piano Performance, 1st Class Honours
- Grade 10 comprehensive certificate in Vocal Performance, 1st Class Honours